Funumber: 99-01057 Ref. No.: FUJ 17.433

CLAIMS

What is Claimed is:

- 1. A layer 2 link handler provided in a network-side device and is connected with a user-side device by a permanent virtual connection path, wherein said user-side device is made to connect to one among multiple specified connection destinations via one of a permanent virtual connection path and a switched virtual connection path, the layer 2 link handler comprising:
- a path specification means that specifies one path of a connection request destination from layer 2 link information that is emitted from the user-side device at the time of a layer 2 link connection request; and
- a path connection means that causes said permanent virtual connection path connected with the user-side device to connect to one path of the connection request destination and form a path between the user-side device and the specified connection destination.
- 2. The layer 2 link handler as described in claim 1, wherein said path connection means includes a distribution means that, by switching on a layer 2 packet level, distributes and transfers packets that arrive from the permanent virtual connection path connected with the user-side device to one path of the connection request destination.
- 3. The layer 2 link handler as described in claim 1, wherein said path connection means includes a setting means that newly sets one path of the connection request destination specified by said path specification means and connects a path between the user-side device and the specified connection destination.
- 4. The layer 2 link handler as described in claim 1, wherein said path connection means includes a labeling means that, based on layer 2 link information emitted from the user-side device at the time of a layer 2 link connection request, assigns a label of each layer 2 link of said connection request to a layer 2 packet from the user-side device, said path connection means further including a transfer means that transfers, by label multiplex layer 2 links, a layer 2 packet labeled by said labeling means to the path to said specified connection destination.
- 5. The layer 2 link handler as described in claim 1, wherein said path connection means recognizes the labels of layer 2 packets that arrive from the permanent virtual connection path with the user-side device and to which labels are assigned for each layer 2 link, and transfers the layer 2 packets to the path to the specified connection destination that corresponds to a given label, and recognizes the labels of labeled layer 2 packets that arrive from the path with the specified connection

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destination and transfers the layer 2 packets to the permanent virtual connection path to the user-side device that corresponds to a given label.

- 6. The layer 2 link handler as described in claim 4, wherein said labeling means includes a selecting means that, when a label is newly assigned to a layer 2 link, selects an arbitrary available label number and emits a labeled layer 2 packet, and said path connection means handles the link of the labeled layer 2 packet that is assigned the same label number and is sent back from the side of the device that received said labeled layer 2 packet, as a link of the pair of said layer 2 link newly assigned a label.
- 7. The layer 2 link handler as described in claim 6, wherein said labeling means includes an assigning means that newly selects a label number and assigns said label number including in the label a marking indicating that it is a transmission from the allocated label number management side, and handles the link of the labeled layer 2 packet sent back from a reception side with the same label number, to which is added a marking indicating a transmission from the label number non-management side, as a link of the pair of the layer 2 link newly assigned a label.
- 8. The layer 2 link handler as described in claim 4, wherein said labeling means, when it newly assigns a label to a layer 2 link, determines the label number by doing a negotiation mutually with another device side.
- 9. The layer 2 link handler as described in claim 4, wherein said labeling means, when it newly assigns a label to a layer 2 link, assigns a label with a label number directed by operation of a network management operation device.
- 10. The layer 2 link handler as described in claim 5, wherein said path connection means recognizes the labels of layer 2 packets that arrive from the permanent virtual connection path with the user-side device and to which are assigned labels according to the quality-of-service class of each layer 2 link, and transfers layer 2 packets to the path to the specified connection destination that corresponds to the given label.
- 11. The layer 2 link handler as described in claim 5, wherein said path connection means recognizes the labels of layer 2 packets that arrive from the permanent virtual connection path with the user-side device and to which are assigned labels according to the connection destination of each layer 2 link, and transfers layer 2 packets to a path to the specified connection destination that corresponds to the given label.
- 12. The layer 2 link handler as described in claim 5, wherein said path connection means recognizes the labels of layer 2 packets assigned according to the distribution type of service in the IP packet within layer 2 link packets that arrive from the permanent virtual connection path with the user-side device, and transfers layer 2

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packets to the path to a specified connection destination that corresponds to the given label.

- 13. The layer 2 link handler as described in claim 1, wherein said path connection means includes an extracting means that extracts the request connection destination name from layer 2 link information emitted from the user-side device at the time of a layer 2 link connection request and a conversion table that converts from said connection destination name to a connection address, and path determining means that uses a connection address obtained from said conversion table to cause a path to be connected between the user-side device and the specified connection destination.
- 14. The 2 link handler as described in claim 1, wheein processing that specifies one path of the connection request destination from layer 2 link information in said path specification means is done under software control by a processor, and the path connection means that connects the permanent virtual connection path of the user-side device to said connection destination after one connection destination path is specified, is constituted by a switching means by means of hardware.
- 15. A layer 2 link path connection method comprising the steps of providing a layer 2 link handler connected by a permanent virtual connection path with the user-side device, extracting by said handler a request connection destination name from layer 2 link information emitted from a user-side device at the time of a layer 2 link connection request, extracting a connection address from said connection destination name by means of a conversion table, and notifying the user-side device connected by a permanent virtual connection path of said connection address, emitting by the user-side device the connection destination address it has been notified of to the network-side device, and based on said connection destination address connected by the network-side device the user-side device and the connection destination by switching of one of permanent virtual connection paths and switched virtual connection paths.